

WECHSLER-BELLEVUE PERFORMANCE
AS A FUNCTION OF INTERPERSONAL ANXIETY

ARTHUR G. STOREY

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THESIS
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THE UNIVERSITY OF ALBERTA

WECHSLER-BELLEVUE PERFORMANCE
AS A FUNCTION OF INTERPERSONAL ANXIETY

A DISSERTATION
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
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BY

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ABSTRACT

The purpose of this study was to investigate the hypotheses that:

1. neurotic individuals behave differently under test conditions than non-neurotics; 2. at least part of this abnormal behavior is due to the face-to-face relationship with the examiner in the usual testing situation; and 3. the neurotic's performance on the Digit Span subtest of the Wechsler-Bellevue Scale is impaired due to his neurosis and his face-to-face relationship with the examiner.

The three Wechsler-Bellevue tests Digit Span, Similarities, and Picture Completion from Form II were administered together with the Digit Span test from Form I to fifty adult neurotics selected on an availability basis. Half of the examinees took the Digit Span test from Form I first, and the same test from Form II last. These Digit Span tests were given in the reverse order to the other twenty-five subjects. Half of the subjects took the test while separated from the examiner by a large screen designed to remove the examinee-examiner face-to-face relationship existent in normal testing situations.

The same tests were given under the same conditions and in the same order to a matched sample of non-neurotic individuals. The samples were matched in respect to age, marital status, and sex. The age range from twenty to forty-seven years with a mean age of 34.46 years.

It was found that the neurotics' overt behavior was significantly different from that of the non-neurotics in that they were more ill at ease, made more errors in the order in which they repeated digits, gave digits in consecutive ascending or descending order more fre-

quently, and repeated digits with undue haste more frequently than did non-neurotics. The neurotics were distracted more frequently than the non-neurotics and named the picture from which the part was missing in the Picture Completion test more often than did the non-neurotics.

No significant differences were found to exist in the neurotics' Wechsler performance insofar as the screened condition was concerned as opposed to the face-to-face condition. Nor was there any significant difference between the neurotics' and the non-neurotics' Digit Span performance in either the screened or the face-to-face condition.

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APPENDIX A

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1. The first part of the report is devoted to a description of the

methodology used.

2. The second part of the report is devoted to a description of the

results of the study.

3. The third part of the report is devoted to a description of the

conclusions of the study.

4. The fourth part of the report is devoted to a description of the

limitations of the study.

5. The fifth part of the report is devoted to a description of the

implications of the study.

6. The sixth part of the report is devoted to a description of the

conclusions of the study.

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7. The seventh part of the report is devoted to a description of the

CHAPTER I

INTRODUCTION

Since the publication of the first scale the Wechsler-Bellevue (hereafter referred to as the W-B) tests have been used as instruments for the diagnosis of various mental disorders including psychoneuroses. Wechsler (1) states that:

The neurotic generally does poorly on tests which require immediate effort. He is inclined to look upon each task as a challenge and is apprehensive of the impression he may make on the examiner. The result is that he is often "blocked", overcritical and erratic. These characteristics may be evidenced on any test but are best revealed by the neurotic's performance on the Object Assembly and the Digit Span.

Subsequent researchers do not agree in any conclusive way that the Digit Span test does in fact differentiate between neurotic and non-neurotic individuals. Frank (2) concludes that the W-B Scale "does not yield significant data as regards psychiatric diagnosis, and continues to sort subjects in terms of intellectual factors only. The use of the Wechsler-Bellevue in a psychiatric setting is once more questioned, and its restrictive use to a test of intelligence re-emphasized." Cohen (3) is not more positive in that he says: "Wechsler-Bellevue subtests do not always measure factor or factors constantly in different types of patients, or do so with varying validity. It is therefore necessary to know a patient's diagnosis in order to know the common factor functions these tests are measuring in him. Unfortunately it is commonly for the purpose of ascertaining diagnosis that the Wechsler-Bellevue

is given." Meyer's (4) findings were similarly negative in that he reports this test does not distinguish between normal and anxiety neurotics. Warner (5) reports that: "In brief, the findings do not support the contention that a relatively low Digit Span score indicates the operation of anxiety."

However, in spite of this evidence to the contrary there are indications that the W-B Scales are useful as aids in the identification of neurotic individuals. Patterson (6) found that W-B test results agreed or partly agreed with psychiatric diagnoses in seventy-eight percent of cases.

Others, notably Geil (7) and Rabin (8) have developed short forms of the W-B Scales in the hope of providing a more clinically useful instrument. Cohen, Bertram, and Steisel (9) in evaluating a number of such short forms of the W-B concluded that Geil's form consisting of the Comprehension, Similarities, Digit Span, and Block Design subtests is perhaps the most useful for screening out individuals with mental disorders.

Rapaport (10) suggests that "Digit Span is the best single subtest for indicating the presence of anxiety..."

The foregoing serves to indicate that the contention as to whether or not the W-B Scale or any of its subtests or combination of subtests does in fact differentiate between neurotic and non-neurotic individuals is not yet concluded. It also indicates that perhaps the Digit Span subtest is the most likely among the tests employed in the W-B Scale to make such a differentiation.

Wechsler (11) indicates that the neurotic is often blocked, overcritical and erratic on tests which require immediate effort. He suggests further that such behavior is due, at least in part, to the fact that the examinee is apprehensive of the impression he may make on the examiner. It would seem, then, that part of the neurotic's reaction to and performance in the test is due to his interpersonal relationships with the examiner.

This apprehensiveness or emotional arousal in the neurotic caused by the whole testing situation including the examiner is not unexpected in view of the symptomatology of neuroses as given by O'Kelly and Muckler (12) and other experts in the field of mental disorders. Easterbrook (13) suggests that such emotional arousal "acts consistently to reduce the range of cues the organism uses and that the reduction in range of cue utilization influences action in ways that are either organizing or disorganizing depending on the behavior concerned".

From the foregoing and from the present investigator's experience with examinees' reactions to both the WAIS and WISC tests it is inferred that the neurotic's emotional arousal might impair his Digit Span performance but that it will show itself more emphatically in behavior peripheral to the task set by the test items themselves. It is implied here that the neurotic's attention is centred on the impression he might make on the examiner rather than on the task set by the test. If this is the case it is expected that his behavior will be different from that of the non-

neurotic who is supposedly concentrating more on the test items than on impressing the examiner. Or, as Easterbrook implies, the non-neurotic is able to utilize a wide enough range of cues to enable him to attend to the total testing situation including the test items and the examiner while the neurotic's emotional arousal reduces his cue utilization to the extent that his behavior is organized in the direction of impressing the examiner with a resultant impairment in his test performance.

It was felt that if the neurotic was more anxious or emotionally aroused than the non-neurotic during the testing he would exhibit behavior designed to reduce this anxiety. It was felt, then, that to the extent that smoking reduces tension the neurotic would smoke relatively more frequently than the non-neurotic while undergoing the test. He might admit to errors in his responses less frequently since the admission of failure might tend to increase anxiety. There is also a possibility that he might bluff or attempt to cover up his lack of ability to respond by saying numbers in the Digit Span test, in consecutive order as in counting or he might make superficial errors such as putting the numbers in the wrong order. Undue haste might also result from his anxiety.

If the neurotic is apprehensive concerning the impression he might make on the examiner it was thought that he might pause longer and more frequently than the non-neurotic in a subconscious attempt to impress his questioner. He might also repeat questions or ask that they be repeated in order to show that he was intent on responding correctly.

Yet, in spite of these attempts it was felt that the neurotic would be distracted from the task set by the test items more frequently than his non-neurotic counterpart. It was also felt that he would show himself to be more ill-at-ease during the testing than the non-neurotic.

The problem, however, is to describe such peripheral to the task behavior in objectively measurable terms. Attempts to do this resulted in those aspects of behavior contained in Table VI (page 17) and defined on pages 18 and 19 of the present study.

It was felt, then, that if the neurotic's Digit Span performance is impaired such impairment is due more to his interpersonal relationships with the examiner than to the functioning of his neurosis. It is also felt that the influence of interpersonal relationships can be demonstrated in behavior peripheral to the task set by the test itself. The implication being that if the interpersonal relationship is removed or altered even by removing the face-to-face situation existent between the examiner and examinee in the normal testing situation both test performance and peripheral behavior will be altered.

It is the purpose of this study, then, to investigate the hypotheses that: 1. neurotic individuals exhibit different behavior peripheral to the central task set by the W-B test than do non-neurotics; 2. neurotic individuals are differentiated from non-neurotics by the Digit Span subtest of the W-B Scale; 3. the differences between the neurotic and the non-neurotic's peripheral behavior and test performance will diminish if the face-to-face relationship between examinee and examiner is removed.

CHAPTER II

METHOD

Sample

For the purpose of this study a neurotic individual is defined as an adult between the ages of twenty and fifty years who has been diagnosed as suffering from neurosis by a psychiatrist and who was undergoing treatment for this ailment at the time he was tested for the present study. It was felt that if the age limit was extended below the age of twenty years there would be a risk of including some of the temporary anxieties surrounding puberty or post-puberty syndromes. Similarly, if the age limit was extended beyond fifty years it was felt that there would be an increased risk of including individuals suffering from senile or pre-senile conditions.

Perhaps more conclusive results would be obtained if the neurotics were tested before treatment began; but the hesitancy of psychiatrists to make patients available for study until they had begun to respond to treatment made it advisable to delay testing beyond the termination of diagnosis.

A non-neurotic is defined as an adult between the ages of twenty and fifty years who has been interviewed by a medical doctor within thirty days of being tested for the purpose of the present study and who was found at that time to be non-neurotic.

The three practicing psychiatrists in the city of Calgary, Alberta in conjunction with two medical doctors and one clinical psychologist diagnosed and made available the fifty neurotic indi-

viduals tested for this study. The role of the medical doctors was by and large that of referral. These fifty subjects are categorized as to neurotic types in Table I. The non-neurotics were diagnosed and made available by various medical doctors practicing in Calgary.

TABLE I

NEUROTIC INDIVIDUALS CLASSIFIED AS TO NEUROTIC TYPES

Classification	Male	Female	Total
Anxiety Reaction	2	12	14
Reactive Depression	8	4	12
Hysterical Reaction	4	4	8
Obsessive Compulsive	6	-	6
Conversion Reaction	2	-	2
Hypochondriasis	2	-	2
Other	6	-	6
Totals	30	20	50

Both the neurotic and non-neurotic individuals tested were obtained on a voluntary basis. The neurotics tested included all of those available for the study. Non-neurotics were selected to match the neurotics obtained in age, sex and marital status. The subjects ranged in age from 20 to 40 years; the mean age being 34.46 years. All testing was done during the months of May and June 1959.

Odd numbered neurotic subjects in each neurotic category given in Table I took the test under a normal face-to-face relationship with the examiner. Even numbered patients in these categories were separated from the examiner by an opaque thirty by twenty-four inch screen placed on the testing table between them

and the examiner. The screen, placed midway between the examiner and examinee, prevented them from seeing each other for the duration of the test including the instructions preliminary to the actual testing. Each neurotic's paired non-neurotic control took the test under the same conditions as the neurotic insofar as the screen was concerned. Henceforth the term "screened condition" will be used to indicate the testing situation when the screen was in use as opposed to the term "face-to-face condition" which will be used to indicate the testing situation when the screen was not in use.

A second numbering system was also used in which both the neurotic and non-neurotic groups were numbered from one through fifty without regard to neurotic categories. Odd numbered individuals in this listing took the tests in order: Digit Span, Similarities, and Picture Completion (W-B Form II) followed by Digit Span (Form I). Even numbered subjects took the Form I Digit Span first and the Form II Digit Span following the Similarities and Picture Completion tests.

The first number system outlined above was necessary in order to collect the data required to test the hypotheses for which the study was designed. The second grouping was designed in order to extend the Digit Span test (the two digit span tests used are assumed to be equivalent for the purposes of this study) and to check for practice effect in neurotics as opposed to non-neurotics.

The particular tests, Digit Span, Similarities and Picture Completion were selected as a result of a study conducted by

McNemar (14). These three tests constitute the only triad of W-B tests to correlate highly with total W-B score and to contain the Digit Span test with which the present study concerns itself. Since this triad correlates .90 with total score they yield a relatively close estimate of the examinee's W-B intelligence quotient.

Procedure

A special record sheet was devised (Appendix A) on which to record examinee W-B responses. Other observations were written into the record as the testing progressed.

Owing to the use of the screen it was necessary to alter the testing procedure in administering the Picture Completion test from that given in the W-B Manual (15). The manual reads: "I am going to show you some pictures in each of which there is a part missing. I want you to look at each picture carefully and tell me what it is. Now look at this picture (presenting card No. 1)" Since it was impossible for the examiner to carry out this procedure exactly under the screened condition it was decided to alter it as follows for all subjects both in the screened and face-to-face condition in the hope of obtaining a standardized procedure for all subjects. The procedure followed was: "You are now going to look at some pictures in each of which there is a part missing. I want you to look at each picture carefully and tell me what it is. Please do not turn to any picture until I ask you to do so (presenting the book of cards). Now turn to the first picture and tell me what is missing...." Timing began immediately following the word "missing". If the correct response was not given instructions as per the test manual were followed. If the correct answer was given the examiner continued with: "Now turn to picture number two (etc) and tell me what is missing."

It should be noted in passing that under this altered procedure the subject might be penalized if, for any reason, he fails

to turn the page quickly when told to do so. It is also possible for him to gain extra time in which to examine pictures by turning to a succeeding one while hidden from the examiner by the screen and before he has been instructed to do so. This danger was minimized by the examiner taking down responses quickly and in an abbreviated form so that there was a minimum of time lapse between the subject's response and the request to turn to the next picture. Also, as indicated by Wechsler (16) the Picture Completion test is not given as a timed test for if the examinee does not make the correct response within fifteen seconds, he is not apt to make it at all.

CHAPTER III

RESULTS

W-B Results

The scores obtained from both the neurotic and non-neurotic groups on each of the subtests and in each of the screened and face-to-face conditions together with an estimate of the significance of the differences in performance of the two groups are reported in Table II.

TABLE II

SCORES OBTAINED FROM BOTH THE NEUROTIC AND NON-NEUROTIC GROUPS
TOGETHER WITH AN ESTIMATE OF THE DIFFERENCES IN PERFORMANCE

Test	Score		Chi-*	P
	Neurotic	Non-Neurotic	Square	
Mean I.Q.	108.29	107.02	1.18(from 100)	>.10
Mean I.Q.	108.29	107.02	.39(inter gp)	>.10
D.S. total	1130	1084	2.58	" >.10
D.S. total f.-to-f.	555	584	.10	" >.10
D.S. total screened	575	536	3.76	" <.10
Simil. total	569	552	.44	" >.10
Simil. total f.-to-f.	292	283	.22	" >.10
Simil. total screened	277	269	.21	" >.10
Pic. Comp. total	466	452	.30	" >.10
Pic. Comp. total f.-to-f. 239		229	.55	" >.10
Pic. Comp. total screened 227		224	.02	" >.10

* Chi-squares corrected for continuity in this and all succeeding tables.

In calculating the intelligence quotients given in Table II each examinee's weighted score was determined by multiplying his

obtained score by 183 (the total number of raw score points possible on a full scale of the W-B Form II test) and dividing the resultant number by 49 (the number of raw score points possible on the three subtests used in this study). The resultant score was then carried to the full scale table in the W-B manual from which the I.Q. was read.

The only relative difference, then, between the raw scores obtained and the I.Q.'s reported in Table II is the correction for age imposed by the W-B table. This correction is the same for both the neurotic and the non-neurotic groups since they were matched for age. For these reasons it is possible to consider the I.Q.'s as total scores when comparing the test performance of the neurotic and non-neurotic groups as done in Table II.

Since the second hypothesis is to be tested by this study and with which Table II concerns itself does not indicate the direction of the differences in performance of neurotics and non-neurotics a two tail test of significance is used. In a two tail test a Chi-square of 3.841 is necessary before the null hypothesis is rejected at the .05 level of significance. An examination of Table II reveals that the largest Chi-square (3.76) approaches significance at the .05 level but is still not significant. Therefore the null hypothesis is not rejected and it is concluded that the tests used did not differentiate between the neurotic and the non-neurotic subjects tested.

Information as to the relative performance of the neurotic individuals under the screened and face-to-face conditions is contained in Table III.

TABLE III

SCORES OBTAINED FROM NEUROTICS UNDER THE SCREENED AND FACE-TO-FACE
CONDITION TOGETHER WITH AN ESTIMATE OF THEIR DIFFERENCES

Test	Screened	Face-to-face	Chi-Square	P
Mean I.Q.	109.24	107.34	.03	>.10
D.S. total both forms	575	555	.96	>.10
D.S. total form I	282	277	.05	>.10
D.S. total form II	293	280	.77	>.10
Similarities total	277	292	.64	>.10
Pic. Comp. total	227	239	.66	>.10

It may be concluded from the information contained in this table that the neurotic individuals did not perform differently insofar as test scores are concerned under the screened and face-to-face conditions.

Table IV contains information pertaining to the relative performance of the non-neurotics on the tests under the screened and face-to-face conditions.

An examination of the information contained in this Table indicates that the non-neurotic individuals did not perform differently on the tests used in the screened and face-to-face conditions.

TABLE IV

SCORES OBTAINED FROM NON-NEUROTICS UNDER THE SCREENED AND FACE-TO-FACE CONDITIONS TOGETHER WITH AN ESTIMATE OF THEIR DIFFERENCES

Test	Screened	Face-to-face	Chi-square	P
Mean I.Q.	107.56	106.48	.02	>.10
D.S. Total both forms	536	548	.62	>.10
D.S. total form I	255	268	.71	>.10
D.S. total form II	281	280	.002	>.10
Similarities total	269	283	.58	>.10
Pic. Comp. total	224	228	.05	>.10

It is interesting to determine whether there was a significant practice effect in the Digit Span test in either the screened or face-to-face condition. Table V gives this information.

TABLE V

DIGIT SPAN SCORES OBTAINED BY NEUROTICS AND NON-NEUROTICS UNDER SCREENED AND FACE-TO-FACE CONDITIONS WITH AND WITHOUT PRACTICE

Test (Neurotics)	Without Practice	With Practice	Chi-square	P
D.S. total screened	282	293	.54	>.10
D.S. total f.-to-f.	275	280	.10	>.10
<u>Test (Non-neurotic)</u>				
D.S. total screened	255	281	3.14	<.10
D.S. total f.-to-f.	268	280	.62	>.10

The information contained in this table indicates that there was no significant difference in the performance of either group in

the screened or face-to-face condition. It might be noted, however, that the absolute gain in raw score was consistently in the direction of practice. This gain was great enough in the screened condition for the non-neurotics to approach significance since a Chi-square of 3.841 is significant at the .05 level.

Rapaport (15) observes that the Digit Span scores of the "hysteric-like" group is considerably impaired. A comparison between the hysterics tested in the present study and their non-neurotic counterparts on Digit Span scores yielded an insignificant Chi-square of .73 so that Rapaport's finding was not substantiated.

Observations of Peripheral Behavior

Any behavior exhibited by the neurotic examinees that the examiner felt might differentiate them from the non-neurotic individuals was noted on the answer sheets. Table VI summarizes the most frequently observed of such peripheral behavior.

TABLE VI

PERIPHERAL BEHAVIOR IN NEUROTIC AND NON-NEUROTIC INDIVIDUALS

Behavior	Frequency in		Chi-square	P
	Neurotic	Non-neurotic		
Habitual smoking	42	34	2.84	<.10
Smoked during the test	15	4	4.54	<.05
Ill-at-ease during test	31	2	35.46	<.05
T.* errors admitted in D.S.	165	187	2.06	>.10
T. order errors in D.S.	168	130	9.16	<.05
T. 3 plus con.nos. D.S.	36	24	2.66	>.10
T. undue haste in D.S.	14	3	7.08	<.05
T. not attending in D.S.	22	3	17.28	<.05
T. repeat Q. in Simil.	72	61	1.04	>.10
T. 5 sec. plus pauses	267	156	37.42	<.05
Mean Sec. per Reap. in P.C.	5.70	4.92	.72	>.10
T. name obj. in P.C.	207	61	95.48	<.05

*Total

Before discussing the implications of Table VI it would be well to explain the behavior it contains. An examinee was said to be ill-at-ease if he showed undue hostility, gestures, nail-biting, finger-tapping, squirming about in his chair, haste in getting out of the testing situation or other behavior, which in the opinion of the examiner, indicated that he was ill-at-ease.

Order errors in the Digit Span test are defined as those Digit Span items that were responded to correctly except for the order in which the digits were repeated. The examinee was said to have re-

peated three or more consecutive numbers when he repeated three or more digits in ascending or descending order as in counting. Undue haste was said to exist when an examinee repeated the numbers in three or more of the Digit Span items faster than the examiner could record them. Subjects were said not to be attending to the digits given by the examiner when they admitted that they were not following.

Each examinee who repeated the question asked him in the Similarities test either before he began his response or at any point during his response was said to have repeated the question.

The five second plus pauses given in Table VI indicates the number of times each subject paused for five or more seconds at any point during the test.

As mentioned earlier, individuals were timed in the Picture Completion test from the moment each question was asked until they began their answer. These times are given in Table VI for the responses that were correct. Times for erroneous responses were not recorded. A note was made in the Picture Completion section of the answer paper for each object named. An example of such an incident would be if the examinee, when asked what was missing in card number one, would say: "the girl's mouth" rather than just "the mouth".

The information contained in Table VI indicates that the neurotic individuals behaved differently in several respects than did the non-neurotics while undergoing the test. They were sig-

nificantly more ill-at-ease, made errors in the order in which they repeated digits, were unduly hasty in reciting digits, paused more frequently in giving answers, and named the objects in the Picture Completion more frequently than did the non-neurotics. They also proved to be more distractable as indicated by their lack of attention. They smoked more frequently than did the non-neurotics.

The question is now raised as to whether the neurotic's behavior was different in the screened condition as opposed to the face-to-face condition. Table VII contains information designed to answer this question.

TABLE VII

PERIPHERAL BEHAVIOR OF NEUROTICS IN SCREENED AND F-TO-F CONDITION

Behavior	Frequency		Chi-square	P
	Screened	F-to-F		
T* smoked during test	3/22	12/20	8.30	<.05
T. ill-at-ease	11/31	20/31	4.81	<.05
T. admt. to errors D.S.	89/165	76/165	1.61	>.10
T. order errors in D.S.	85/168	83/168	.05	>.10
T. 3 plus con. nos. D.S.	14/36	22/36	2.72	<.10
T. undue haste in D.S.	8/14	6/14	.14	>.10
T. not attending in D.S.	7/22	15/22	11.00	<.05
T. repeat Q.s in Simil.	34/72	38/72	.25	>.10
T. 5 sec. plus pauses	148/267	119/267	5.84	<.05
M ¹ secs. per corr. resp.P.C.	5.46	5.94	.12	>.10
T. name obj. in P.C.	110/207	97/207	1.36	>.10

* Total ¹ Mean

An examination of the above table indicates that the neurotics tested in the screened condition smoked less frequently, were less ill-at-ease, and were distracted less often than those tested under the face-to-face condition. However, they paused more frequently during the test than did those tested without the screen.

It is suggested that the lower incidence of smoking in the screened as opposed to the face-to-face condition be discredited as a significant difference in peripheral to the task behavior because the screen altered the social situation and made smoking awkward or difficult. It might seem quite socially amenable to smoke while undergoing a test in a face-to-face situation and otherwise when separated from the examiner by an opaque screen. Also it might prove difficult to smoke when sitting within a foot of a screen.

The next problem is to discern whether the non-neurotics' peripheral behavior was different under the screened and face to face condition. Table VIII gives this information.

TABLE VIII

PERIPHERAL BEHAVIOR OF NON-NEUROTICS SCREENED AND FACE-TO-FACE

Behavior	Frequency		Chi-square	P
	Screened	F-to-f		
No. who smoked during t.	1/20	3/14	.75	>.10
Were ill-at-ease	1/2	1/2	.00	>.10
Admitted to D.S. errors	97/187	93/187	.09	>.10
Order errors in D.S.	56/130	74/130	4.82	<.05
Undue haste in D.S.	1/3	2/3	.00	>.10
Not attending in D.S.	2/3	1/3	.00	>.10
Repeat Qs. in Simil	32/61	29/61	.13	>.10
Five Sec. plus pauses	74/156	82/156	.63	>.10
Secs/corr. resp. in P.C.	4.64	5.20	.37	>.10
Name obj. in P.C.	26/61	35/61	2.23	>.10
3 plus con.nos. D.S.	10/24	14/24	.75	>.10

The information given in Table VIII indicates that the non-neurotic group made more errors in the order in which digits were repeated in the face-to-face condition than in the screened condition. Table VII indicates that this did not occur in the neurotic group.

Table IX contains the information designed to test whether the neurotic's peripheral behavior becomes more like that of the non-neurotic when the neurotic is tested under the screened condition and the non-neurotic takes the test in the usual face-to-face condition.

TABLE IX

PERIPHERAL BEHAVIOR OF NEUROTICS UNDER SCREENED CONDITION COMPARED WITH SUCH BEHAVIOR IN NON-NEUROTICS UNDER FACE-TO-FACE CONDITION

Behavior	Frequency		Chi-Square	$\frac{1}{2}P$
	Neurotics	Non-Neurotics		
Smoked during test	3/22	3/14	.04	>.10
Ill-at-ease during test	11/31	1/2	.53	>.10
Order errors in D.S.	85/168	74/130	.66	>.10
Undue haste in D.S.	8/14	2/3	.01	>.10
Not attending in D.S.	7/22	1/3	.01	>.10
Five sec. plus pauses	148/267	82/156	.11	>.10
Name obj. in P.C.	110/207	35/61	.18	>.10

It is pointed out that Table IX contains only those aspects of behavior from Table VI which differentiated the neurotics from the non-neurotics. It should also be noted that since the third hypothesis indicated the direction of the change that the one tail or one half of P is used in Table IX.

CHAPTER IV

DISCUSSION AND SUGGESTIONS

Discussion of Results

The present study was designed to test the hypotheses that:

1. neurotic individuals exhibit different behavior peripheral to the central task set by the W-B test than non-neurotics; 2. neurotic individuals are differentiated from non-neurotics by the Digit Span subtest of the W-B Scales; and 3. these differences between the neurotic and non-neurotic's peripheral behavior and test performance will diminish if the face-to-face relationship between the neurotic and the examiner is removed.

In support of the first of these hypotheses it was found that the neurotics (Table VI) smoked more frequently, were more ill-at-ease, showed more haste in answering, paused more often, and were more often distracted during the test than were the non-neurotics. Also the neurotics' test answers were different from those of the non-neurotics in that Digit Span errors were more frequently mere counting in ascending or descending order, and objects from which parts were missing in the picture completion test were named more frequently.

These findings seem to indicate, as discussed earlier (p. 3-5) that the neurotic is more ill-at-ease or emotionally aroused in the testing situation than is the non-neurotic. They may also be interpreted as indicative of the suggestion that the neurotic attempts to reduce this anxiety and that he tries to make a favourable impression on the examiner. No inference can be made from these find-

ings as to the degree or direction of the reduction in the range of cue utilization discussed by Easterbrook (13). Some indications concerning cue utilization might be obtained should the second hypothesis be supported by the obtained W-B data. However, it is the main purpose of the present study to test the hypotheses outlined above rather than the theoretical considerations underlying them.

The present study found no evidence (Table II) to support the second hypothesis, that is the hypothesis that the W-B will differentiate between neurotics and non-neurotics. In this respect it supports the data made available by Frank (2), Cohen (3), Heyer (4), and Warner (5) in separate studies, to the effect that the W-B test will not differentiate between individuals on a psychiatric basis. In confirming the findings of these four authors, the present study, of course, fails to support the opposite contention put forward by Wechsler and Rapaport independently that Digit Span tests will differentiate between neurotics and non-neurotics.

Since the test performance of the neurotic and non-neurotic groups was not different (Table II) it was not expected that there would be any difference in the performances of the two groups in the screened as opposed to the face-to-face conditions. Moreover, Tables III, IV, and V contain the data necessary to confirm this expectation. No significant difference was found to exist between the two groups' test performance in the screened and face-to-face conditions. Thus the part of the third hypothesis which concerned itself with differences in test performance is rejected.

Data contained in Table IX confirm the remaining part of this hypothesis. It was found (Table VI) that the neurotics and non-neurotics differed in certain kinds of overt behavior peripheral to the central task set by the test. It was hypothesized that such behavior on the part of the neurotics would become more like that exhibited by the non-neurotics if the face-to-face situation were removed in the case of the neurotics. This hypothesis is confirmed by the data presented in Table IX.

A word of caution is necessary, however, insofar as the data contained in Tables VI, VII, VIII, and IX is concerned because there is some danger of bias on the part of the examiner in observing such behavior when he knows the examinee's diagnosis in advance of giving the test, this, in spite of every attempt to be objective in both selecting the kinds of behavior to observe and in observing it. Secondly, it is possible that some such behavior might escape the examiner's notice in the screened condition that might be recorded in the face-to-face condition.

An examination of the kinds of behavior recorded in these tables, especially in Table IX, however, will serve to indicate that the possibility of bias and failure to observe is remote if the examiner is as objective and observant as possible, and when such behavior is defined as it is on pages 18 and 19 inclusively of this thesis.

The number of individuals who smoked during the test and reported in these four tables should be again mentioned. It was

probably difficult and associal for the individuals tested in the screened condition to smoke. For this reason it is suggested that little importance be given to the findings concerning smoking.

Table VII indicates that the neurotics tested in the screened condition were less ill-at-ease, paused more frequently, and were less often distracted than those tested under the face-to-face condition. Table VIII indicates that the non-neurotics tested in the screened condition made fewer of the "counting" type of errors in the Digit Span test than did the non-neurotics tested in the face-to-face condition.

Perhaps it could be inferred from the information contained in these two tables that both the neurotic and non-neurotic individuals were less ill-at-ease when tested in the screened condition. However, such an inference is not being made here, particularly in the case of the non-neurotic sample, because of the very small incidences of some of the behavior observed and because a significant difference was found in one kind of behavior observed.

Rapaport (17) indicates that: "The Obsessive-Compulsives and Hysterics both show impairment on Picture Completion....". It is interesting to note that the present study Obsessive-Compulsives when compared with their non-neurotic opposite numbers yielded an insignificant Chi-square of .00. However, the Hysterics when compared with their non-neurotic opposite numbers yielded a Chi-square of 10.95 which is significant beyond the .01 level. But, far from confirming Rapaport's statement this study contradicts it by finding that the hysterics did significantly better on the Picture Completion test than did the non-neurotics.

It is pointed out however, that there were only eight hysterics tested in the present study and that each of them had been under treatment for their hysteria before they were tested. These factors tend to weaken the findings of the present study in respect to the hysterics' performance on the Picture Completion test.

BIBLIOGRAPHY

The first of the two main parts of the book is devoted to a general survey of the history of the theory of the firm. It begins with a discussion of the classical theory of the firm, which is based on the assumption of perfect competition and perfect information. This theory is then contrasted with the modern theory of the firm, which is based on the assumption of imperfect competition and imperfect information. The second part of the book is devoted to a detailed analysis of the modern theory of the firm. It begins with a discussion of the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information. This theory is then contrasted with the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information.

The third part of the book is devoted to a detailed analysis of the theory of the firm as a social institution. It begins with a discussion of the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information. This theory is then contrasted with the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information. The fourth part of the book is devoted to a detailed analysis of the theory of the firm as a social institution. It begins with a discussion of the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information. This theory is then contrasted with the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information.

The fifth part of the book is devoted to a detailed analysis of the theory of the firm as a social institution. It begins with a discussion of the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information. This theory is then contrasted with the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information. The sixth part of the book is devoted to a detailed analysis of the theory of the firm as a social institution. It begins with a discussion of the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information. This theory is then contrasted with the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information.

The seventh part of the book is devoted to a detailed analysis of the theory of the firm as a social institution. It begins with a discussion of the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information. This theory is then contrasted with the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information. The eighth part of the book is devoted to a detailed analysis of the theory of the firm as a social institution. It begins with a discussion of the theory of the firm as a social institution, which is based on the assumption of bounded rationality and imperfect information. This theory is then contrasted with the theory of the firm as a game, which is based on the assumption of rational behavior and perfect information.

SUGGESTIONS FOR FURTHER RESEARCH

1. Since the individuals comprising the neurotic group in the present study were undergoing treatment for neuroses when tested the degree to which they were neurotic might be questioned. It is suggested, therefore, that results of testing might be different and the degree of neurosis might be more acute and uniform if the patient was tested as soon as he was diagnosed as neurotic, perhaps on his first visit to the psychiatrist.

It might also be suggested here that such a procedure would be most difficult for other than a medical practitioner or clinical psychologist. Psychiatrists, it will be found, are very hesitant to make their patients available for research purposes until the initial symptoms of their neuroses have begun to respond to treatment.

2. Different results from those reported in the present study might be obtained if testing was done on a compulsory rather than on a voluntary basis as in this project for to test only those who signify their willingness to co-operate is to test a biased sample. Again, however, the difficulty of obtaining the patients who are unwilling to take part in research must be indicated if the researcher is other than a medical practitioner or clinical psychologist.

3. The results of research projects resembling the present study might be more valid if all testing were done at a single location. For, if it is not, there is always the question of whether an in-

dividual, especially one suffering from neurosis, would perform differently or behave differently depending on whether he was tested in his own home, the examiner's office, a psychiatrist's office, or in the psychiatric ward of a hospital, to mention four places in which testing was carried out in the present study. Furthermore, if the testing is not all done in a single location or at least in similar locations, it is almost impossible to repeat a study in order to confirm its findings.

4. As mentioned earlier, there is always danger of bias in observing the kind of behavior called peripheral to the task set by the test in this study. This danger would be much diminished if all subjects tested for the study were tested without the examiner having a knowledge of the diagnosis.

5. The question of what constitutes a neurotic and even a non-neurotic might also be raised, not to mention what places an alleged neurotic in one category rather than another. In the present study the onus of diagnosis often lay with a single psychiatrist. It is suggested that a consensus of opinions might be more valid.

CHAPTER V

CONCLUSIONS

1. Neurotic individuals were found to exhibit different behavior peripheral to the central task imposed by the test than non-neurotic individuals.
2. Digit Span, Similarities, and Picture Completion performance of neurotics was not found to be impaired.
3. The removal of the face-to-face condition between the neurotic and the examiner during testing resulted in the neurotic's behavior peripheral to the test changing in the direction of the behavior exhibited by non-neurotic individuals undergoing testing in the usual face-to-face condition.

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APPENDIX A

Name..... Diagnosis Sex ...
Marital Status ... Occupation Education ...
Age ... Hab. Smoker ... Condition ... Diagnostician
Score D.S. II ... Simil. ... Pic. Comp. ... D.S. I ... Total ... I.Q.....

DIGIT SPAN FORM II (Digits Forward)

(3) 3, 8, 6.	Consec. ...	Ord.
6, 1, 2.	" ...	"
(4) 3, 4, 1, 7.	" ...	"
6, 1, 5, 8.	" ...	"
(5) 8, 4, 2, 3, 9.	" ...	"
5, 2, 1, 8, 6.	" ...	"
(6) 3, 8, 9, 1, 7, 4.	" ...	"
7, 9, 6, 4, 8, 3.	" ...	"
(7) 5, 1, 7, 4, 2, 3, 8.	" ...	"
9, 8, 5, 2, 1, 6, 3.	" ...	"
(8) 1, 6, 4, 5, 9, 7, 6, 3.	" ...	"
2, 9, 7, 6, 3, 1, 5, 4.	" ...	"
(9) 5, 3, 8, 7, 1, 2, 4, 6, 9.	" ...	"
4, 2, 6, 9, 1, 7, 8, 3, 5.	" ...	"

DIGIT SPAN FORM II (Digits Backward)

(2) 2, 5.	" ...	"
6, 3.	" ...	"
(3) 5, 7, 4.	" ...	"
2, 5, 9.	" ...	"

APPENDIX A (Continued)

(4)	7, 2, 9, 0.	Consec.	Ord.
	8, 4, 1, 3.	"	"
(5)	4, 1, 6, 2, 7.	"	"
	9, 7, 8, 5, 2.	"	"
(6)	1, 6, 5, 2, 9, 8.	"	"
	3, 6, 7, 1, 9, 4.	"	"
(7)	8, 5, 9, 2, 3, 4, 2.	"	"
	4, 5, 7, 9, 2, 8, 1.	"	"
(8)	6, 9, 1, 6, 3, 2, 5, 8.	"	"
	3, 1, 7, 9, 5, 4, 8, 2.	"	"

SIMILARITIES:

1.	Plum-Peach	Rep't
2.	Beer-Wine	"
3.	Cat-Mouse	"
4.	Piano-Violin	"
5.	Paper-Coal	"
6.	Pound-Yard	"
7.	Scissors-Copper pan	"
8.	Mountain-Lake	"
9.	First-Last	"
10.	Salt-Water	"
11.	Liberty-Justice	"
12.	The number 49-The Number 121	"

PICTURE COMPLETION:

1.	Girl (Mouth)	Named	Time
2.	Cat (Whiskers)	"	"

APPENDIX A (Continued)

3. Door (Hinge)	Word	Time	.....
4. Scissors (Screw) .....	"	.....	" .....
5. Rooster (Spur) .....	"	.....	" .....
6. Card (Centre Spade) .....	"	.....	" .....
7. Coat (Button Holes) .....	"	.....	" .....
8. Fish (Fin or Fins) .....	"	.....	" .....
9. Fly (Antennae) .....	"	.....	" .....
10. Thermometer (Mercury in Bulb) .....	"	.....	" .....
11. Hat (Hat Band) .....	"	.....	" .....
12. Umbrella (Spokes) .....	"	.....	" .....
13. Cow (Cleft in Hoof) .....	"	.....	" .....
14. House (Shadow of Tree) .....	"	.....	" .....
15. Profile (Eyebrow) .....	"	.....	" .....

DIGIT SPAN FORM I: (Digits Forward)

(3) 5, 8, 2.	Consec....	Ord.	.....
6, 9, 4. ....	"	.....	" .....
(4) 6, 4, 3, 9. ....	"	.....	" .....
7, 2, 8, 6. ....	"	.....	" .....
(5) 4, 2, 7, 5, 1. ....	"	.....	" .....
7, 5, 8, 3, 0. ....	"	.....	" .....
(6) 6, 1, 9, 4, 7, 3. ....	"	.....	" .....
3, 9, 2, 4, 8, 7. ....	"	.....	" .....
(7) 5, 9, 1, 7, 4, 2, 8. ....	"	.....	" .....
4, 1, 7, 9, 3, 8, 6. ....	"	.....	" .....
(8) 5, 8, 1, 9, 2, 6, 4, 7. ....	"	.....	" .....
3, 8, 2, 9, 5, 1, 7, 4. ....	"	.....	" .....

APPENDIX A (Continued)

(9) 2, 7, 5, 8, 0, 2, 5, 8, 4	Consec.	Ord
7, 1, 3, 9, 4, 2, 5, 6, 8.	"	"

DIGIT SPAN FORM I (Digits forward)

(2) 2, 4,	"	"
5, 8.	"	"
(3) 6, 2, 9.	"	"
4, 1, 5.	"	"
(4) 3, 2, 7, 9.	"	"
4, 9, 6, 8.	"	"
(5) 1, 5, 2, 8, 6.	"	"
6, 1, 8, 4, 3.	"	"
(6) 5, 3, 9, 4, 1, 8.	"	"
7, 2, 4, 8, 5, 6.	"	"
(7) 8, 1, 2, 9, 3, 6, 5.	"	"
4, 7, 3, 9, 1, 2, 8.	"	"
(8) 9, 4, 3, 7, 6, 2, 5, 8.	"	"
7, 2, 8, 1, 9, 6, 5, 3.	"	"

Note: If the examinee repeated the digits in any item more quickly than the examiner could write them down the item was marked correct or incorrect and an "R" was entered to indicate "Rushing". Since all items were timed a "P" was entered in the answer space for every pause of five seconds or longer duration except in the Picture Completion test where the total time or length of the initial pauses were noted in seconds.

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